Wisconsin Geological
and Natural History Survey

I. C. 6339

SEPTEMBER, 1930

DEPARTMENT OF COMMERCE

UNITED STATES BUREAU OF MINES
SCOTT TURNER, DIRECTOR

INFORMATION CIRCULAR

SAFETY AT THE MINES OF THE FORD COLLIERIES CO., CURTISVILLE, PA.

BY

C. W. JEFFERS

Digitized by Google

I.C. 6339.
September, 1930.

INFORMATION CIRCULAR

DEPARTMENT OF COMMERCE - BUREAU OF MINES

SAFETY AT THE MINES OF THE FORD COLLIERIES CO.[1]

By C. W. Jeffers[2]

At its annual meeting on March 5, 1928, in Washington, D. C., the Joseph A. Holmes Safety Association gave to the Ford Collieries Co., Curtisville, Pa., a certificate of honor for "having worked 922,628 underground man-shifts from August 14, 1920, to December 31, 1926, producing 5,755,669 short tons of coal without a fatality."

This remarkable record certainly deserved recognition. It developed that this company's freedom from fatalities continued until October 2, 1929, hence the full period during which no underground fatalities occurred was from August 14, 1920, to October 2, 1929, or 9 years, 1 month, and 18 days, the total tonnage being over 7,700,000.

Table 1, shows the complete safety record of the Ford Collieries Co. since 1920 as given by the officials of the company.

The first item in Table 1 shows a remarkable performance. This company since 1920 has mined 15 times more coal per fatal accident than the average production per fatal accident for the State of Pennsylvania in 1928 (255,257 tons).

Excluding the two fatalities (one in 1922 and one in 1929) the severity rate for the same period has been 1.259 per thousand hours worked, a record of which the company may justly be proud. However, including the fatal accidents the rate is 2.407. This compares favorably with an average of 12.4 in 1928 for 66 mines in the National Safety Competition.

The Ford Collieries Co. operates three mines located in the vicinity of Curtisville, Allegheny County, Pa. One of these mines, Benjamin No. 1, is idle at the present time.

The officials are: A. R. Pollock, general manager, Curtisville, Pa., and C. W. Pollock, assistant general manager in charge of safety and operation.

---

1 - The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from U. S. Bureau of Mines Information Circular No. 6339."

2 - Associate mining engineer, safety division, U. S. Bureau of Mines.

Digitized by Google

Table 1.- Safety Record of Ford Collieries Co., Curtisville, Pa.

[illegible]er	Average number of employees	Total hours worked by all employees	Production, net tons	Fatal accidents	Lost-time injuries, compensable	Lost-time injuries, non-compensable	Number of lost-time injuries	Total No. lost-time injuries for year	Total days lost, all injuries
1920 to 1926	1142	7,381,024	5,755,669	1-10/28/22	222	503	161	725	1/ 14,310
1927	739	674,776	347,364		14	66	72	80	1,061
1928	436	791,729	511,879		103	131	104	234	1,055
1929 to 10/31/29	891	1,603,867	1,155,652	1-10/2/29	180	278	93	458	2/ 8,735
Totals		10,451,396	7,770,564	2	519	978	430	1497	25,211

Net tons per fatality	3,885,282 tons
Frequency rate per million hours worked	143.2
Severity rate per thousand hours worked	3/1.259
Tons mined per lost-time accident	5,191 tons

1/ Includes fatality on October 28, 1922.
2/ Includes fatality on October 2, 1929.
3/ The severity rate of 1.259 does not include 2 fatalities.

Digitized by Google

The coal mined is the Thick Freeport bed, which is an unusually thick portion of the Upper Freeport, occupying an area north of Pittsburgh along the Allegheny River. It is the top bed of the Allegheny series and averages about 6 feet in thickness - 5 feet of good coal and 1 foot of bony coal which is discarded in the loading process.

The excellent safety record of the Ford Collieries Co. undoubtedly has been the result of several contributing factors which were observed during a recent inspection made at the Berry mine. These factors are given below and short discussions follow.

1. Attitude of the management.
2. Supervision.
3. Discipline.
4. Good timbering standards closely followed.
5. Careful blasting practices.
6. Good clearance maintained.
7. The functioning of a good safety organization.

1. Attitude of the Management

The first and by all means the most important requirement for the success of a safety program is to have the full backing of the management. Too many coal companies vest men with the title of safety engineer but do not require the support of the operating officials, and as an almost invariable consequence safety is not obtained. It is gratifying to note that the men in charge of the operation of this company are fully in accord with the idea of safety in mining and are absolutely behind the safety program. The general manager, Mr. A. R. Pollock, and the assistant general manager in charge of safety and operation, Mr. C. W. Pollock, are to be commended for their continued stand in regard to safety. It is interesting to observe the reflection of their attitude in the mine officials, and it is a good example of the primary requirement that safety rests with the operating heads.

2. Supervision

Close supervision has been advocated by a relatively limited number of safety experts for a number of years and experience has shown that operations utilizing it have met with success both from operating and safety standpoints. A brief review of the system in effect at the Ford Collieries Co. mines illustrates how much supervision has contributed toward success in its safety program.

The organization chart (fig. 1) clearly shows the authority and responsibility of each company official. The mine foreman is held directly responsible for the underground operation, and all orders pertaining to the inside of the mine are issued to and through him. This is a very important factor in obtaining efficient management and discipline in any individual mine.

Digitized by Google

The fact that the head officials of this company put a certain phase of the work in charge of a man whom they believe is thoroughly capable, hold him directly responsible, and do not allow anything to "go over his head," explains how obedience and loyalty of workers are obtained and retained. Some of the rules concerning duties and supervision are as follows:

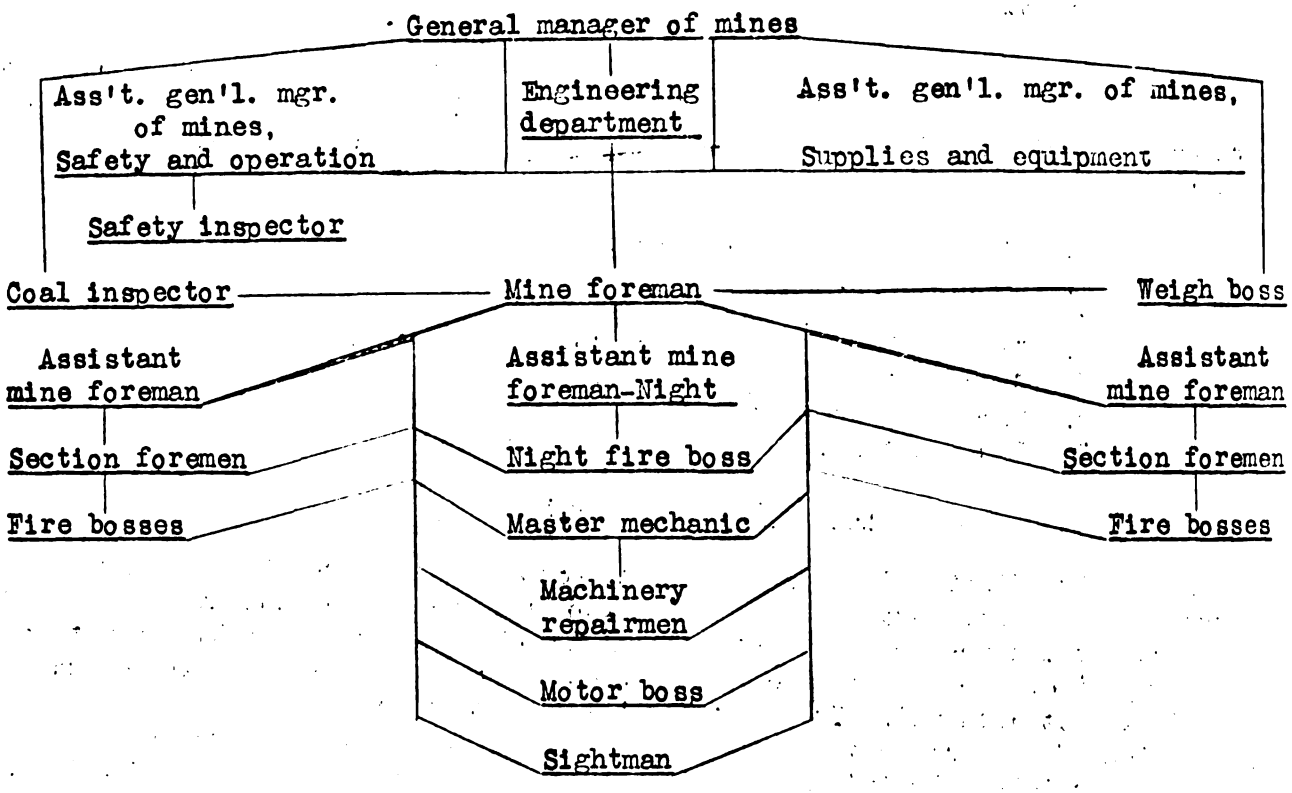

Figure 1.- Chart of underground official organization of the Berry mine, Ford Collieries Co.

1. The mine foreman shall have full authority underground and all instructions to be passed on to other employees, must be delivered to, and passed on to others by him.

2. Assistant mine foremen are directly under the management of the mine foreman, are subject to his instructions, and through them his orders are to be delivered to section foremen.

3. Assistant mine foremen to have first-grade mine foreman's certificate.

4. Section foremen to have either first-grade or assistant mine foreman's certificate.

Digitized by Google

5. Section foreman to be in full charge of and be responsible for his section, under direction of his assistant mine foreman.

6. Day shot firing to be done by section foremen.

7. Night shot firing to be done by assistant mine foreman and fire boss.

8. When necessary, fire boss may assist section foreman in shooting morning round of shots.

9. Twenty-five loaders shall be a maximum for a section under normal conditions, and under no condition shall number of loaders exceed 30.

10. Dead work and yardage to be taken by the assistant mine foreman, assisted by the section foreman.

11. When conditions permit, one fire boss will serve for two section foremen.

12. All tracklayers, brattice men, wiremen, motormen, pumpers, road cleaners, or other laborers are subject to instructions of section foreman in charge of section on which they are working.

The mine foreman spends essentially all of the time of his working shift underground and visits as much of the mine as possible, looking after the general operation and safety of the mine.

The assistant mine foremen visit as much of the mine assigned to them as possible and keep in close touch with all of their territory through their section foremen and fire bosses. They get in many of the working places assigned to them each day. The assistant mine foremen have an average of 212 men to supervise.

The section foremen also act as shot-firers and visit each working place under them several times each day. By having the shotfiring duty assigned to them they are directly responsible for the timbering and posting of the working places and for safe shooting practices. They have absolutely no excuse if a place is shot before it is properly timbered according to the company timbering standards. Each section foreman has an average of 35 men under his charge which should enable him to visit each working place about every two and a half hours.

Fire bosses make their inspections before the men enter the mine and spend the rest of the shift looking after the general safety of the mine, at times assisting the section foremen with the shot firing. Each fire boss has an average of 71 men under his direction, and he should visit each man once after the shift starts.

Advantages observed in the close supervision afforded by this organization, both from operating and safety viewpoints, are:

Digitized by Google

1. Careful shooting.
2. Timbering standards closely followed.
3. Track well laid with good clearance.
4. Loaders do not have opportunity to "leave the mine" early because section foremen keep in touch with them.
5. Doors used in ventilating system closely watched by section foremen.
6. Loose rock and top coal taken down when discovered.
7. Motor crews checked and maximum work obtained from them.
8. Mine well examined for methane.
9. Working places kept in order and in good condition.
10. Mining machine crews well supervised.
11. Clean coal loaded.

3. Discipline

Good discipline must be maintained throughout an organization to get enforcement of rules and regulations. During the inspection of the mine it was observed that the mine foreman, Mr. J. W. Brey, had his men well under control; his orders and also those of the other officials were promptly and efficiently carried out without argument. While no printed rules are issued, established rules and regulations were well followed and all men showed a willingness both to observe standards and to obey orders. This discipline, however, could not have been possible without the full cooperation of the management and is merely a reflection of the attitude of the head officials.

4. Good Timbering Standards

While roof conditions can be classed as good essentially throughout the mine (there being freedom from slips and "pots") and roof falls are relatively readily controlled, standards are felt by the management to be necessary in timbering and posting because they eliminate the personal element or choice in regard to timbering and the setting of posts. However, hand in hand with standards of any kind there must be good discipline. Without good discipline there is disregard for the standards and the ultimate failure of their purposes. At the mines of the Ford Collieries Co. the standards for placing of posts or props in machine-cut places call for two lines of posts to be set for each machine cut, approximately 7 feet in depth, and that two rows of posts be carried in places 18 feet wide and three rows in places 24 feet wide. Also, posts must be set within 6 feet of the face before shooting. In pick-mined places posts must be set within 4 feet of the face before mining. Coal is spragged when undermined, and sprags are set not more than 7 feet apart. The very well-timbered condition of the mine, notwithstanding the much more than ordinarily "good" roof, and the fact that there have been very few accidents from roof falls, indicate that systematic timbering pays well even when roof is supposedly good.

5. Careful Shooting Practices

The shooting of the coal is done by the section foremen who load, tamp, remove electric detonator lead wire "shorts," attach shooting cables, and

Digitized by Google

fire the shots. Permissible explosives are used, shots are fired with permissible shot-firing units, and clay is used for tamping material. Having the section foremen act in the shotfirer capacity results in careful handling of explosives and in good shooting practices. It is believed that the shooting at this mine is accomplished as safely as possible, outside of the fact that it is done at all times during the shift and with the men in the mine. If all blasting were as carefully and systematically done as it is in this mine, there would be relatively little opposition to blasting during the working shift.

6. Good Clearance Maintained

One of the best and most positive ways to assist in reducing or "holding down" haulage accidents to the minimum is to maintain good clearance along all haulage roads. The clearance at this mine is well maintained, and the Ford Collieries Co. is to be commended for the thoroughness of the clearance throughout the mine. Shelter holes along haulageways, at doors, and at switch-throws are also well maintained.

7. The Functioning of a Good Safety Organization

All members of the official family at each operation belong to a safety committee which meets monthly. Each month a joint meeting of the safety committees is held and presided over by the general manager, Mr. A. R. Pollock. At these meetings accidents which have occurred are discussed, and ways and means of preventing recurrences are decided upon. Recommendations made by these committees are closely followed and carried out. At the safety meetings the members are urged to speak frankly, and thoroughly to give their views pertaining to the safety of the mines.

The mine is rated as gassy by the Pennsylvania Department of Mines and all employees use permissible electric cap lamps and officials carry permissible flame safety lamps. Utmost care is taken in connection with ventilation, and as a result there have been no explosions or known gas ignitions in this mine.

The use of safety equipment such as the safety shoe, the hard hat, goggles, and carbon monoxide self-rescuers, has not been made compulsory in the mines of this company. The officials believe such equipment has a very definite value, however, and encourage its use.

First-aid and mine-rescue instruction is given to provide trained men in the event of accident, fire, or explosion and to stimulate interest in the general safety program. Recently 100 per cent training in first-aid was accomplished, and it was received enthusiastically by all of the personnel. A thoroughly equipped mine-rescue station is maintained at Curtisville, and over 20 men have received instructions in mine-rescue by representatives of the U. S. Bureau of Mines within the last six months. Inside the mine a locomotive maintained for use in case of accident is kept at all times in readiness, fully equipped with first-aid material. A surface receiving station

Digitized by Google

located near the man and supply shaft provides facilities for caring for injured men after being brought to the surface.

A full-time safety inspector is employed who devotes his entire efforts to improvement of conditions and to enforcement of the rules and regulations. He investigates all accidents and makes recommendations to prevent recurrences. This inspector reporting to the general manager affords a definite check as to the manner in which the mine officials are cooperating with the safety program.

It is believed that the education of employees in proper safety methods should be practiced along with enforcement of rules. A miner should be made to realize, if possible, that such rules and regulations as have been decided upon are primarily for his own benefit. In the mines of the Ford Collieries Co. the foremen assume a helpful rather than an antagonistic attitude. They make an honest attempt to show the men why they are required to follow certain practices and then if the rules are not lived up to, definite disciplinary action is taken. The men are penalized by lay-offs, the extent of which depends on the infraction, and finally dismissal is used when the men do not obey safety rules after having been given a fair opportunity to do so. It is significant that very few dismissals are necessary, and the value of the system is borne out by the safety performance attained.

The safety record attained by this company proves what can be done when definite effort is expended in the right direction for safety. The officials do not believe their system is perfect and are always open to suggestions, which they adopt when sufficient value is shown. They are proud of their safety performance, but they believe better results can be obtained and are striving for this always.

Digitized by Google